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WORLD WAR TWO OUTSTANDING U.S. AIRCRAFT

PLUS ODD AIRCRAFT

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Street & Smith Publications, Inc.

AMERICA'S OUTSTANDING AIRCRAFT OF WORLD WAR II

Selection and Data by PETER M. BOWERS



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OUTSTANDING AMERICAN MILITARY AIRCRAFT OF WW-II

The airplanes presented in the first section of this booklet have been chosen with great care to represent the most outstanding airplanes of the various types used by the U. S. Army and Navy during World War II. The task of picking them was not an enviable one for the author because of the wide interpretation applied to "Outstanding," which is considered synonymous with "Best," by different individuals. Consequently, he has had to be able to back his choices with extensive justification and irrefutable logic.

Does "Best" mean fastest airplane of a particular type? Not necessarily. Speed is only one of the many characteristics by which an airplane is rated. Was an airplane considered outstanding because it was the most widely used? There are many cases that refute this, although numbers and service life did influence the selection. A good example was the P-40, obsolescent by European combat standards even before the United States entered the war. However, it was available in greater numbers than any other American fighter at that time, and the factory was tooled up for a high rate of production. While this design was far from the best when compared to others just getting into production, it had the essential advantage of availability and was therefore the best that could be put into action at a particular time.

Another problem in making selections is the difficulty in making direct comparisons between similar types. Just because two airplanes carry P-for-Pursuit designations does not mean that they are directly comparable. Heavy turbo-supercharged models like the P-38 and the P-47 were at their best at high altitude, but their size and weight handicapped them for tight dog-fighting at lower altitudes where the P-40 was at its best.

Sometimes, too, a major change can make a winner out of what might have been merely an also-ran. An excellent example is the P-51. Developed to meet a British requirement, it was disappointing as a fighter when powered with the original Allison engine. The British relegated their first "Mustangs" to such low-level work as photo missions and fighter sweeps against ground targets. For a while, the U. S. Army wasn't

very interested in it as a fighter, and placed its first order for the new design as a dive bomber under the attack designation of A-36. British inspiration opened a whole new career to the design when Rolls-Royce "Merlin" engines as used in the famous "Spitfires" and "Hurricanes" were installed experimentally in several test Mustangs. The performance improvement, especially at altitude, was phenomenal. The results were transmitted to the U. S. Army and the manufacturer, and the rest is history. At first, the change to the Packard-built "Merlin" engine, already in use in improved Curtiss P-40F "Warhawks," was thought to be justification for an entirely new model number and the designation of XP-78 was assigned to the American test model. However, since the airframe itself was the same as the production P-51A and the use of a different model number would only complicate the spare parts and supply problems, the test model became XP-51B and the production version became P-51B. Subsequent modifications and improvements made their contribution to what is undeniably one of the finest fighter planes the world has ever seen, but none were as significant as the original change of powerplant.

Sometimes an airplane outclassed in its original function turns out to be surprisingly effective in a different role. The Bell P-39 "Airacobra," not included in this presentation for this reason, is representative. The British used it only for a short time in Europe, and the U.S.A.A.F. didn't use it there at all although it was used in the early stages of the Southwest Pacific campaigns. Hundreds were sent to Russia, where, thanks to their 37mm cannon and low-altitude maneuverability, they proved to be excellent tank busters. The Russians didn't even care about other characteristics. Their inspection teams visiting U.S. modification centers in 1943/44 to inspect Russian-bound P-39's were primarily concerned with three things: Would the engine run? Would the cannon shoot? Had an essential structural modification to the tail been accomplished?

Sometimes the term "Best" can be applied because another one—"Only"—has been applied first. Now that the record is complete, it is evident that the B-29, a remarkable airplane, was also a truly great weapon. It was in a class all by itself at the end of the war,

but greatness in this case did not come entirely as the result of a monopoly in the heavy bombardment business. In fact, the B-29 looked pretty much like a failure during much of its year in action. Its target in Japan, reached from distant bases in China or tiny Pacific atolls, were right at the end of all the operating radius that could be built into it. It had been designed for much shorter missions, so the extended range forced a reduction of the bomb load in order to carry the extra fuel needed to get the bombs to Japan. While it was equipped with a pressurized cabin for operation at high altitudes, the necessity of holding these altitudes for extended periods during the run in to the target sacrificed further bomb load for still more fuel. Then too, the airplane itself was still having teething troubles as a result of being rushed into action long before completion of the normal shakedown period that would be expected for such a complex machine. The demands of war made it imperative to get over the target with some bombers as soon as possible rather than have no bombers there until they were considered perfectly suited to the task.

A final pair of handicaps to the early B-29 reputation were the facts that the standard high-explosive bombs as used in Europe were relatively ineffective against Japanese cities and that the radar bombsights didn't do a good job of bombing from high altitude through the dirty weather that prevailed over Japan for so much of the time. The effectiveness of the B-29 as a weapon began when General Curtis LeMay took one of the major gambles of the war and tailored B-29 missions to prevailing Japanese target conditions. Since fighter opposition was not a serious deterrent, he ordered large-scale raids at unheard-of low levels—10,000 feet—with fire bombs instead of high explosive. Fuel saved by elimination of the high-altitude operation was replaced by more bombs. So successful was this technique, and so ineffective the fighter resistance, that even the defensive machine guns were left home on some missions in favor of still more bombs.

"Love is Blind" the poet said, and many obvious faults are easily obscured by sentiment to further complicate an unbiased selection of "The Best." Little differences between supposedly identical models soon become apparent, and an almost personal relationship builds up between the man and his assigned machine. This is well illustrated by the personal names and insignia applied to everything from bombers to pursuits

during the war years. However, the fierce loyalties that some crews developed for their planes led them to magnify their virtues and minimize their faults. Arguments with other crews over the relative merits of different models were highly colored on both sides by personal pride. An example of such an airplane is the Martin B-26, left out of this compilation because of its controversial nature. While it was improved continually throughout the war, the major change being a six-foot increase in wingspan, none of the modifications improved it to the extent that the engine change transformed the P-51. The B-26 was an outstanding airplane to those who loved it, and while they may feel that their love has been slighted here, sentiment alone cannot place it in our listing.

A completely opposite case is that where an airplane is included when all normal considerations of obsolescence and comparative performance are against it. The Curtiss SOC "Seagull" was the last American combatant biplane, and was slated for replacement by the more modern SO3C monoplane even before Pearl Harbor. The fact that everything flyable was urgently needed at the time gave the old biplane a new, and supposedly temporary, lease on life. However, it turned out that its faster replacement just couldn't do the same job as well and was forced to relinquish the job to the old timer.

While there are a few marginal models and even unrepresented types that should be included in a compendium of "The Best," they were left out in deference to the space requirements of AIR PROGRESS magazine for which the original presentation was prepared. Even then, some illustrations were deleted by the editor although the tabular data were retained. These photographs have been restored here. Other worthy planes were not included in order to keep the presentation from becoming unrepresentative as a result of concentrating too heavily on a number of closely-related types.

After all of the considerations enumerated above were applied "The Best," as presented here, boils down to a selection of those airplanes which were most effective in the performance of their designated tasks and which collectively represent the many facets of American Air Power as it was applied during World War II.

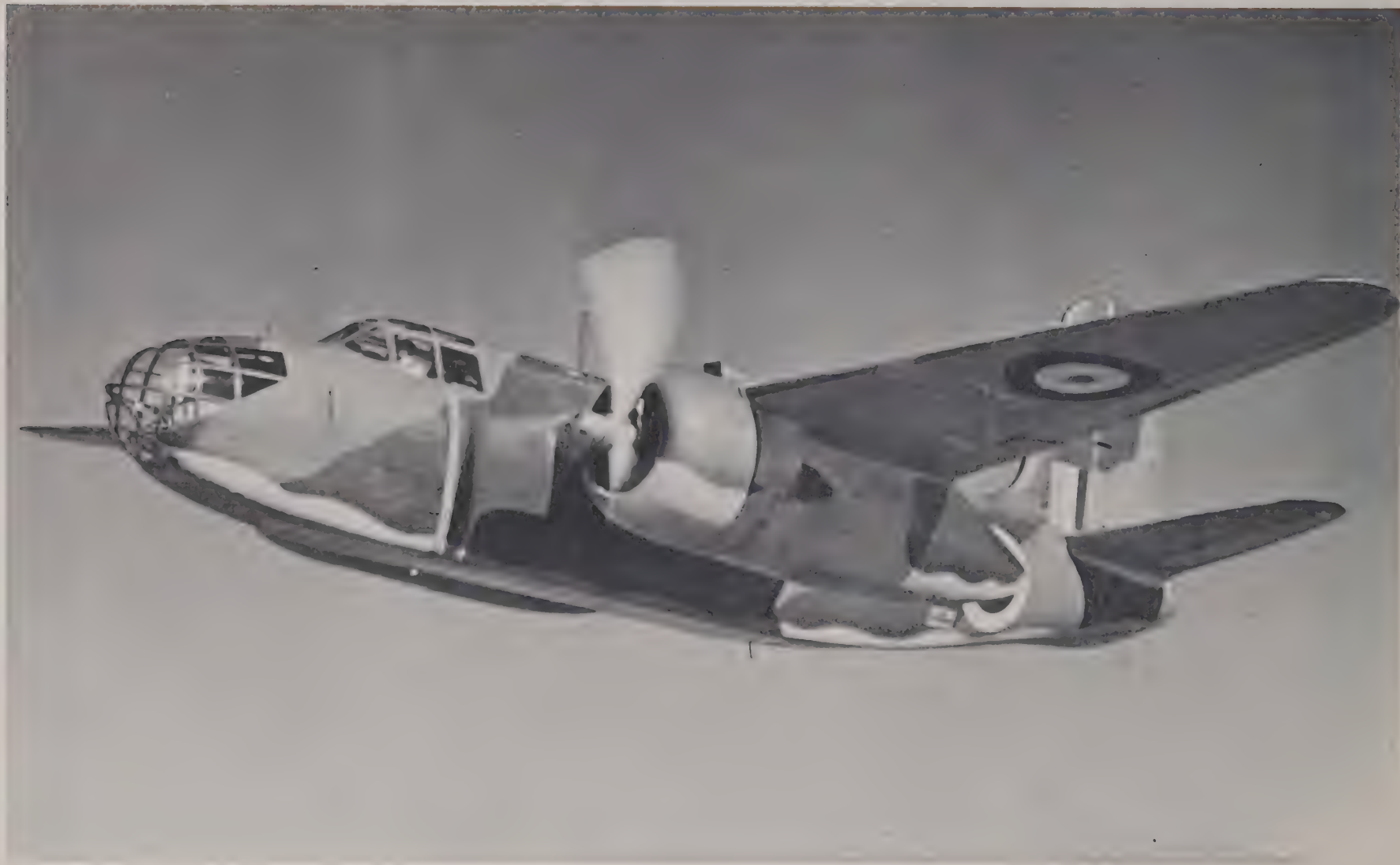
I'll stand by these.

Peter M. Bowen

Chart I

BASIC DESIGNATION	MANUFACTURER	TYPE	OTHER SERVICE NAMES AND DESIGNATIONS	FIRST FLEW	NUMBER MADE	POWERPLANT	CREW	ILL. ON PAGE	SPAN (FT.)	LENGTH (FT.)	AREA (SQ. FT.)	
A-20A	Douglas	Attack	Havoc I RAF Boston II RAF P-70, F-3 Army BD 2 Navy	Aug. 17, 1939	7,097 All Models	Wright R-2600-11 1600 H.P.	3	8	61'4"	47'	465	
A-20G				1943		Wright R-2600-29 1700 H.P.	2	9		48'4"		
B-17D	Boeing	Heavy Bomber	Fortress I RAF	July 21, 1940	38	Wright R-1820-65 1200 H.P.	7-9	11	103'9"	67'10"	1420	
B-17G			Fortress III RAF PB-1 Navy F-9, C-108 Army	May 21, 1943	4,035	Wright R-1820-98 1200 H.P.	6-10			74'9"		
B-24D	Consolidated	Heavy Bomber	Liberator RAF PB4Y-1 Navy AT-22 Army	Dec. 29, 1939 (Prototype)	18,031 All Models	P & W R-1830-43 1200 H.P.	6-9		110'	63'	1048	
B-24J			Liberator VI RAF F-7, C-109 Army			P & W R-1830-65 1200 H.P.	10	12		67'2"		
B-25B	North American	Light Bomber	Mitchell RAF AT-24 Army	Aug. 19, 1940 (Prototype)	9,813 All Models	Wright R-2600-9 1700 H.P.	5	13	67'7"	52'11"	610	
B25H-J			Mitchell RAF PBJ-1J Navy F-10 Army			Wright R-2600-13 OR-29 1700 H.P.	4-5	14		53'6"		
B-29	Boeing	Heavy Bomber	Superfortress P2B-1 Navy F-13 Army	Sept. 21, 1942 (XB-29)	2,841 All Models	Wright R-3350-23 2200 H.P.	10-14	15	141'3"	99'	1739	
A-2	Lockheed	Patrol Bomber	Hudson III RAF PBO-1 Navy AT-18 Army	1939	800 All Models	Wright GR-1820- G205A 1200 H.P.	5	16	65'6"	44'4"	551	
C-46	Curtiss	Cargo	Commando R5C-1 Navy	Mar. 26, 1940 (Prototype CW-20)	3,183 All Models	P & W R-2800-51 2000 H.P.	4 Crew 40 Troops	17	108'1"	76'4"	1360	

EMPTY WEIGHT (LBS.)	GROSS WEIGHT (LBS.)	MAX. SPEED (MPH)	ARMAMENT	REMARKS	
14,647	20,150	349	(5-7) .50 MG	This design originally produced for France under factory designation of DB-7 and was powered with P&W R-1830-S3C4G engines. Remaining production models delivered to British after fall of France in 1940. Later models for Britain and US powered with 1500-1700 HP Wright R-2600 Cyclones. Original Army A-20 series fitted with turbo superchargers, later converted to P-70	and F-3. "Havoc," from which P-70 derived, was night fighter modification initiated by British. Late A-20G models added Martin power turret to top of fuselage. H and K models had interchangeable bomber or gunnery noses. Rest of airframe was identical, and designations were changed to suit.
**	20,000	325	(4) 20-MM (3) .50 MG or (9) .50 MG		
29,021	47,242	300	(6) .50 MG (1) .30 MG	Developed in 1934-35 by Boeing as a private venture, the prototype of the B-17 crashed at Wright Field shortly after delivery, but its performance was so impressive that production orders were placed. Turbo superchargers added to B-17B, improving high-altitude performance. Greatest major change in design was addition of larger tail and power turrets on B-17E, introduced	in 1941. First models in action were 20 B-17C's diverted to England in 1940. Remaining C's converted to D's with armor, self-sealing tanks. F resembled E with molded nose, G added chin turret. B-17's are still in service as personnel transports and as air-sea rescue and patrol planes. Many have been destroyed while serving as radio-controlled targets for missiles.
32,720	60,000	295 @ 25,000'	(13) .50 MG		
**	56,000	303	(7) .50 MG	First 26 B-24's to roll out of factory were diverted to British under factory designation of LB-30. Simultaneous delivery to both U.S. and Britain followed. A number of the early British models recalled to U.S. service were operated as LB-30's and used the original British serial numbers. Growth of B-24 series paralleled that of B-17 with addition of heavier guns and power	turrets fore and aft and above and below fuselage. Relative merits of the two designs will never be settled as long as there are Ex-B-24 and Ex-B-17 pilots alive to argue them. Navy used B-24D and later models as PB4Y-1, and single-tail variants known as PB4Y-2 are still in service with Naval Reserve units. Last production Army model, B-24N, also had single tail.
37,160	60,000	275 @ 26,600	(10) .50 MG		
20,400	28,460	300+	(1) .30 MG (4) .50 MG	The first six production B-25's had wings with straight dihedral instead of the familiar "gulled" configuration. B-25 and 25A armament consisted of four .30 MG's and a single .50 operated by the prone tail gunner. B-25B eliminated the tail gun position for a power dorsal turret with two .50's and a remote-controlled belly turret with two more .50's. B-25G eliminated bombardier	from nose and added 75-mm cannon and two .50's for forward fire against ground targets. Some H models increased nose armament to 8 .50's and added two package guns to each side of nose as well. Top turret moved forward of wing on H. Some early B-25's were redesignated as AT-24, later to TB-25. Many still in service as TB-25 trainers and VB and CB-25 transports.
21,100	33,500	303	(12-18) .50 MG (1) 75 MM		
69,610	120,000	365 @ 25,000'	(8) .50 MG (1) 20 MM	The B-29's began continuous bombing of Japan from distant bases in China in June '43, later were based on islands closer in as they became available. Normal armament consisted of four remote-control turrets and a tail turret. High-speed B-29B's eliminated all turrets and sighting blisters but the tail turret.	Postwar production model was originally called B-29D but was changed to B-50. Range of some B-29's extended in 1948 by addition of in-flight refueling facilities while others were converted to hose or boom refueling tankers.
12,536	18,500	284	(5) MG	A-28 and A-29 were designations of Lockheed Hudsons built to British order but taken over by US. A-28 used P&W R-1830 and A-29 used Wright R-1820, were identical otherwise. Navy PBO duplicated A-29. Since British power turrets were not available	in U.S., most A-29's substituted open rear cockpit manned by gunner with single .30 MG. Bomber and gunnery trainer produced to U.S. order was called AT-18.
29,483	45,000	265 @ 13,000'	—	C-46 was military development of commercial CW-20 transport that first flew in 1939 and tested as C-55. The single prototype was later sold to Britain. C-46 differed mainly in having large cargo door on left side of fuselage and fewer cabin windows.	C-46D model added paratrooper jump door to right side, and C-46E had Douglas-type windshield. Most distinctive feature of C-46 series was double-lobe fuselage. Still in service with USAF and in wide civilian use.
** indicates data not available.					





Douglas A-20G



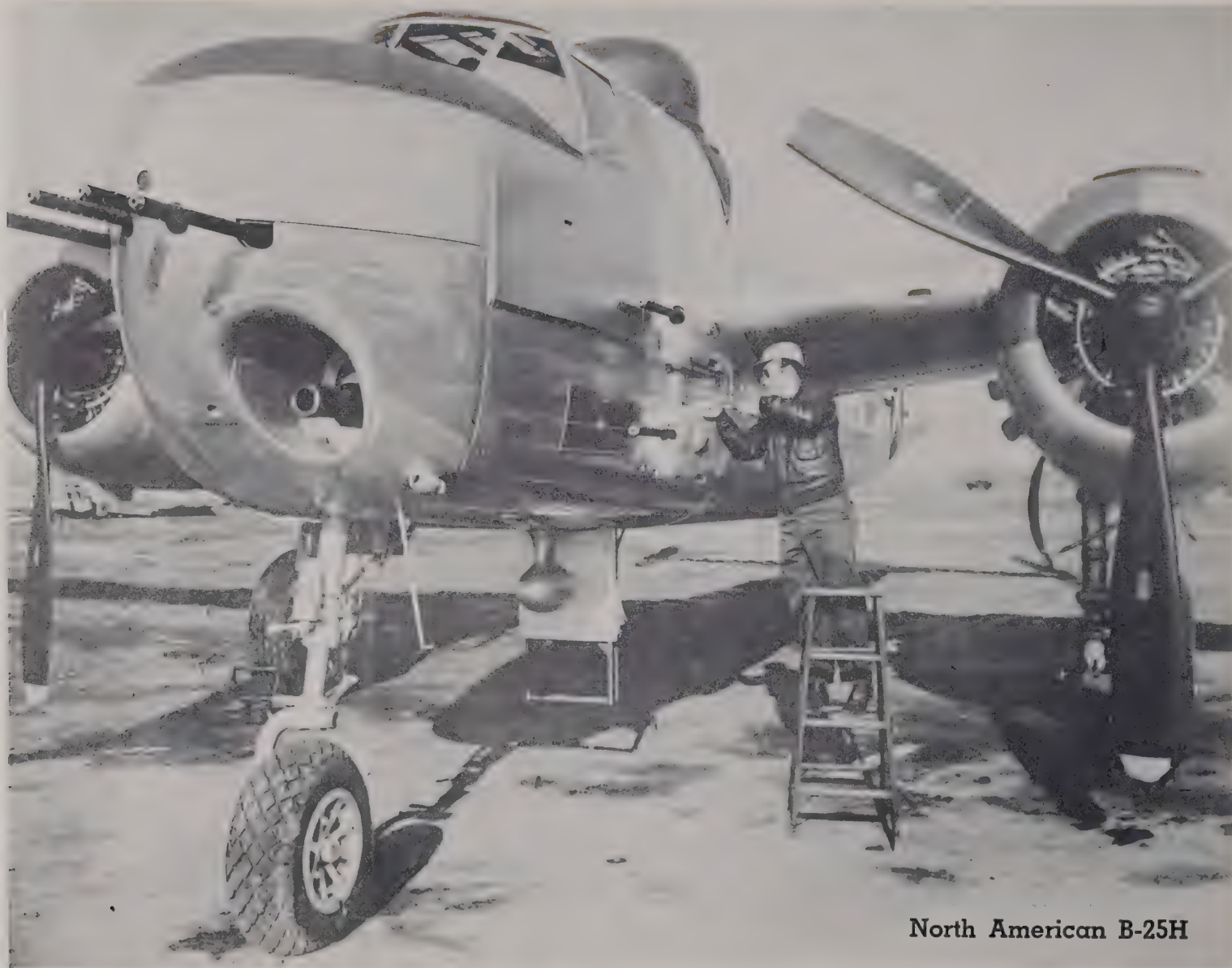


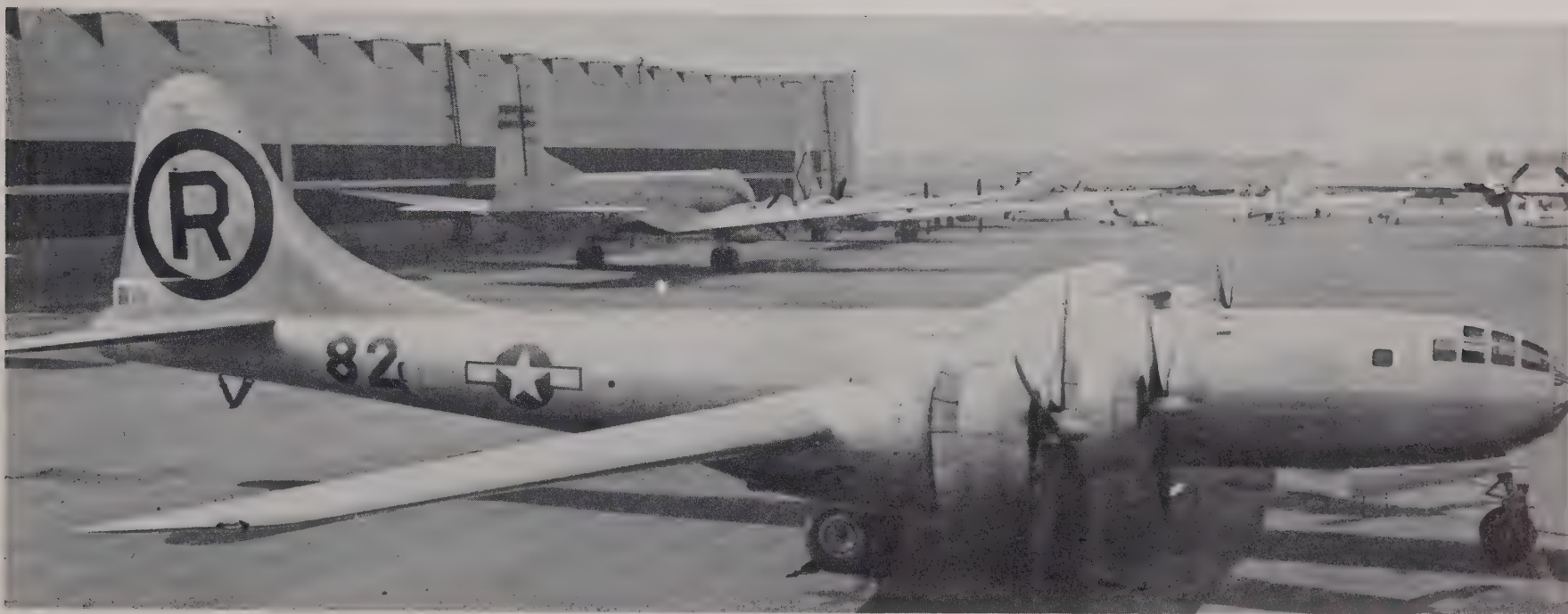
Boeing B-17G





North American B-25-B





Boeing B-29



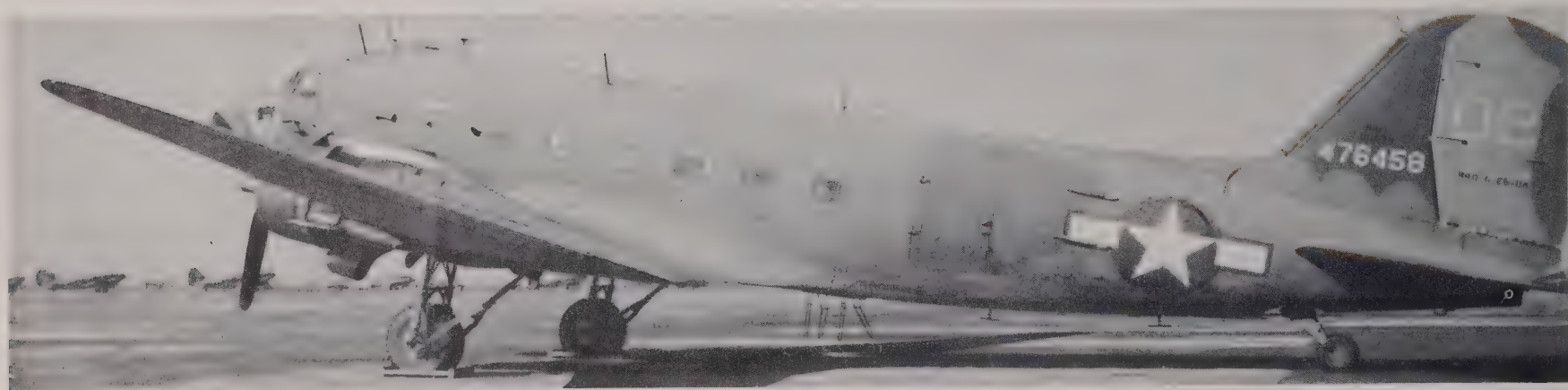


Curtiss C-46

Chart II

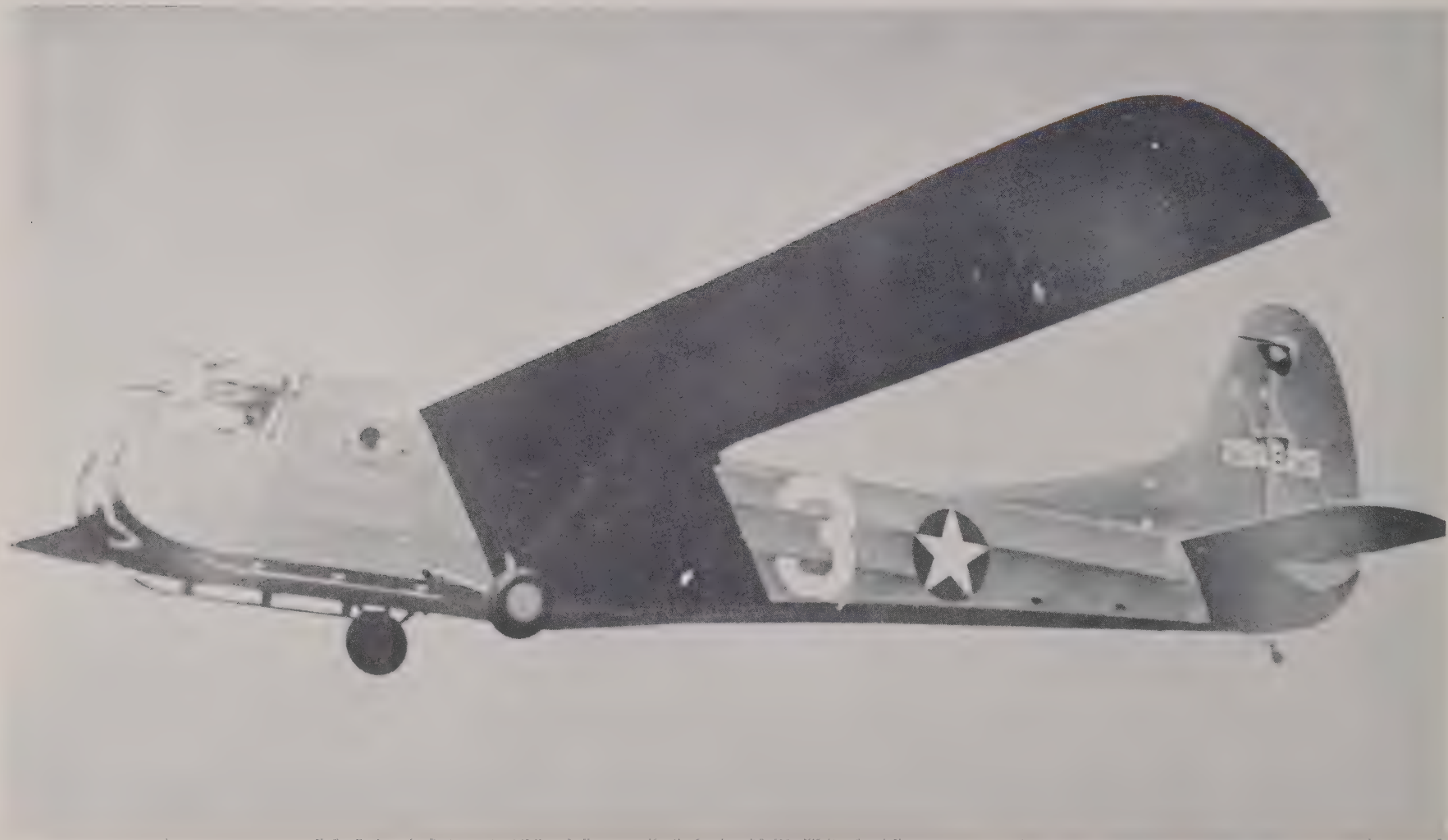
BASIC DESIGNATION	MANUFACTURER	TYPE	OTHER SERVICE NAMES AND DESIGNATIONS	FIRST FLEW	NUMBER MADE	POWERPLANT	CREW	ILL. ON PAGE	SPAN (FT.)	LENGTH (FT.)	AREA (SQ. FT.)	
C-47	Douglas	Cargo	Dakota RAF R4D-1 Navy		10,123 C-47 and C-53)	P & W R-1830-92 1200 H.P.	3 Crew 28 Troops	20	95'	64'6"	987	
C-54	Douglas	Cargo	Skymaster RAF R5D-1 Navy	1942	953 All Models	P & W R-2000-3 1100 H.P.	6 Crew 26 Troops	21	117'6"	93'11"	1462	
CG-4A	Waco	Cargo Glider	Hadrian RAF		13,912 All Models	—	2 Crew 13 Troops	22	83'8"	48'4"	852	
L-4	Piper	Liaison	Grasshopper NE-1, 2 Navy	1941	5,671 All Models	Continental 0-170-3 65 H.P.	2	23	35'3"	22'4"	178	
P-38E	Lockheed	Fighter	Lightning RAF F-4, F-5	Jan. 27, 1939 (XP-38)	9,393 All Models	Two Allison V-1710-27, -29 1150 H.P. Each	1	24	52'	37'10"	328	
P-38L		Night Fighter				Two Allison V-1710-111, -113 1475 H.P. Each	2					
P-40B	Curtiss	Fighter	Tomahawk II RAF	1938 (XP-40)	11,997 All Models	Allison V-1710-33 1040 H.P.	1	25	37'4"	31'8"	236	
P-40L			Kittyhawk II RAF			Packard V-1650-1 1300 H.P.		26		33'4"		
P-47B	Republic	Fighter	Thunderbolt RAF	May 6, 1941 (XP-47B)	15,678 All Models	P & W R-2800-21 2000 H.P.	1	27	40'9"	34'10"	300	
P-47D						P & W R-2800-77 2100 H.P.		28	42'3"	36'1"	322	
P-47N								29				

EMPTY WEIGHT (LBS.)	GROSS WEIGHT (LBS.)	MAX. SPEED (MPH)	ARMAMENT	REMARKS	
16,970	26,000	229	—	C-47 is military cargo version of commercial Douglas DC-3 introduced in 1936. Combination of earlier DC-2 and DC-3 served Army as C-38 and C-39 in immediate prewar years. First Army DC-3 was C-41. Before War, Douglas had sold manufacturing	rights to Japan, which produced a military model similar to C-47, and to Russia, which produced a model sometimes fitted with power turret. C-47 and equivalent Navy R4D still in wide use by both services and U.S. Airlines.
36,400	62,000	274	—	First C-54's were commercial DC-4's requisitioned from factory before delivery to airlines in 1942. C-54A and subsequent were redesigned to meet military requirements and featured large double cargo door on left side of fuselage, heavy floor, increased	tankage, etc. C-54J was personnel transport without the cargo configuration. Postwar development was C-112 and C-118, equivalent to commercial DC-6.
3,790	7,500-9,000 Max.	125 on Tow	—	Waco CG-4 and smaller predecessor CG-3 changed American concept that military gliders were operated like sailplanes and established them strictly as flying boxcars that increased the military load of the towing airplane. Large wing of CG-4A gave	low landing speed, but reduced towing speed, so smaller wing was fitted to same fuselage, producing CG-15. Plans to use cargo gliders in postwar commercial operations never materialized.
740	1,300	87	—	First Army Piper Cubs were stock commercial models loaned by manufacturer for trial in 1941 War maneuvers and were given designation of O-59. Production models, later called L-4, incorporated military equipment and large transparent areas around	the cockpit for better crew visibility. Taylorcraft and Aeronca Tandems were used likewise, first as O-57 and O-58 then as L-2 and L-3.
12,700	14,424	395	(1) 20 MM (4) .50 MG	The Lockheed XP-38 created a sensation upon its initial appearance in January, 1939 because of its unconventional twin-fuselage configuration. On February 11 it set a California-to-New York speed record, but crashed on final approach to Mitchel Field. Production continued, however, and the design underwent few outward changes throughout the war. XP-38 used left-hand prop on right engine, right-hand prop on left engine. Production	models reversed this. Armament of P-38's through D was 1 37-mm cannon, two .30 and two .50 MG's. Later models used 20 mm and four .50's. A unique feature of camouflaged P-38's was unpainted and polished spot on inboard side of each engine cowl that served as a mirror so pilot could check visually that his landing gear was down.
**	17,500	410			
5,475	7,645	360	(2) .50 MG (4) .30 MG	XP-40 was developed by removing the P&W R-1830 radial engine from a standard Curtiss P-36A fighter and substituting a liquid-cooled Allison V-1710. Production models through E all used Allison. No P-40A's were built as such, the planes being delivered to Britain as Tomahawks. One P-40A was created by making a photo plane out of a standard P-40. P-40K and L used Packard-built Rolls-Royce Merlin engines. P-40R was a conversion, re-	placing Merlins by Allison's in P-40F's and L's. Late P-40F and subsequent models had rear portion of fuselage lengthened by 20", altering appearance considerably. A number of TP-40's were produced by adding a second cockpit to standard models. P-40E's were first Army fighters to fly from Navy carriers during African campaign of 1942.
**	9,750	352	(6) .50 MG		
**	13,356	429	(8) .50 MG	P-47 was a direct development of Seversky P-35 design of 1935 through the refined P-43 series and the unbuilt P-44, and was first Army airplane to use the P&W R-2800 engine. Fat fuselage of P-47 series soon earned nickname of "Jug." All models through P-47D-15 had conventional cockpit with fuselage built up behind for fairing. P-47D-20 and on featured bubble canopy and cut-down aft portion of fuselage. P-47N was considerably	redesigned, with larger wing and squared-off wingtips. Basic armament of eight .50 MG's was standard on all service models, but variety of external armament in form of bombs and rockets was infinite. For long-range missions, some P-47's were fitted with three drop tanks, one under each wing and one under fuselage.
**	21,200	450	(8) .50 MG (2) 500 lb. Bombs (10) 5" Rockets		





Douglas C-54





Piper L-4





Curtiss P-40B





Republic P-47B



Republic P-47D—not on chart



Republic P-47N—not on chart

Chart III

BASIC DESIGNATION	MANUFACTURER	TYPE	OTHER SERVICE NAMES AND DESIGNATIONS	FIRST FLEW	NUMBER MADE	POWERPLANT	CREW	ILL. ON PAGE	SPAN (FT.)	LENGTH (FT.)	AREA (SQ. FT.)	
P-51A	North American	Fighter	Mustang II RAF A-36 Army	Oct. 1940	13,666 All Models	Allison V-1710-81 (F20R) 1200 H.P.	1	32	37'	32'3"	233	
P-51D			Mustang IV RAF F-6D Army			Packard Merlin V-1650-9 1490 H.P.						
AT-6A	North American	Trainer	Harvard II RAF Texan (Army - Navy) SNJ-3 Navy	1939 (BC-1A)	10,357 All Models	P & W R-1340-AN-1 600 H.P.	2	33	42'	28'11"	254	
PT-13D	Boeing Wichita	Trainer	Kaydet RAF N2S Navy PT-17, 18 -27 Army	1935 (Civil Proto)	10,346 All Models	Lycoming R-680 220 H.P.	2		32'2"	25'14"	297	
F4F-4	Grumman	Fighter	Martlet RAF Wildcat RAF FM-1, 2 Navy	1938 (XF4F-2)	7,100	P & W R-1830 900 H.P.	1	34	38'	28'10"	260	
F6F-3	Grumman	Fighter	Hellcat RAF	Aug. 1942	11,000	P & W R-2800-10W 2000 H.P.	1		42'10"	37'6"	334	
F4U-1	Vought	Fighter	Corsair RAF F3A-1 Navy FG-1 Navy	1939 (Proto)	9,736 (to July) 1945)	P & W R-2800-8 2000 H.P.	1	36	41'	33'4"	314	
SOC-3	Curtiss	Scout-Observation	Seagull Navy	1935 (XO3C-1)	305	P & W R-1340 550 H.P.	2	37	36'	31'8" (Land)	342	
PBY-5A	Consolidated	Patrol Bomber	Catalina III RAF OA-10 Army	1935 (XP3Y-1)	2,000	P & W R-1830-92 1200 H.P.	7-10		104'	63'10"	1400	
PBM-3	Martin	Patrol Bomber	Mariner RAF	1938 (XPM-1)	1,200+	Wright R-2600-12 1700 H.P.	7		118'	80'0"	1408	
SBD-3	Douglas	Dive Bomber	Dauntless RAF A-24 Army	1940	5,936 All Models	Wright R-1820-52 950 H.P.	2		41'	32'	325	
TBF-TBM	Grumman	Torpedo Bomber	Avenger RAF	Late 1941	2,200 (Grumman) 4,800 (G.M.)	P & W R-2600-8 1700 H.P.	3		54'2"	41'	490	
J2F-2	Grumman	Utility	Duck	1934 (XJF-1)	600	Wright R-1820-30 790 H.P.	2		39'	34'	409	

	EMPTY WEIGHT (LBS.)	GROSS WEIGHT (LBS.)	MAX. SPEED (MPH)	ARMA-MENT	REMARKS
	**	9,000	390	(4) .50 MG	"Mustang" was designed originally to British order, and prototype flew 100 days after design work was initiated. Fourth and tenth ships built were diverted to Army as XP-51. Initial Mustang armament had two .50 MG's in nose and one .30 and one .50 in each wing. P-51's had four 20-mm in wings, and P-51A's had four .50's in wings only. "D" used six .50's. British tried Rolls-Royce Merlin in some Mustangs in England with such success that factory redesigned the ship to take the Packard built Merlin, used in P-51B and subsequent models. Production models from "D" on used bubble canopy. P-51K was identical to "D" except for use of Aeroproducts propeller instead of Hamilton Standard. Lightweight P-51H with higher vertical fin developed too late in war to see action.
	**	11,100	437	(6) .50 MG (2) 1,000 lb. Bombs	
	4,106	5,248	205	(1-2) .30 MG	Direct development of Army BC-1 of 1936 which was used by Britain and Canada as Harvard I. Redesignated model known as BC-1A was redesignated as AT-6 in 1941. Navy used similar type as SNJ. British as Harvard II. Models built in Canada by Noorduyn were designated as AT-16 but were delivered to British and Canadians. Only AT-16's in U.S. service were acquired from British forces overseas. Many wartime AT-6's were rebuilt by factory as T-6G in 1948-1951.
	1,936	2,717	124	—	PT-13 developed as result of Army testing commercial Stearman Model 70, which was similar to Navy NS-1 standard trainer. PT-13 fitted with Lycoming R-680 engine. PT-17 and PT-18 were identical airframes with 220 HP Continental and Jacobs engines, respectively. PT-27 was winterized PT-17 with cold-weather canopy for Canadians. All three Army models used by Navy under N2S designation. PT-13D and N2S-5 were so identical that ships were delivered with both designations painted on same airframe.
	5,895	7,975	284	(6) .50 MG (4) .50 (FM-1)	Grumman "Wildcats" were standard U.S. shipboard fighter at time of Pearl Harbor. British had taken over initial orders placed by French and named them "Martlet." Later models adopted U.S. "Wildcat" name. F4F-3 had fixed wings, later F4F-4 had rearward-folding wings to simplify storage aboard ship. Models built by General Motors were called FM-1. Change from P&W R-1830 engine to Wright R-1820 resulted in FM-2, best recognized by higher vertical tail.
	9,212	12,730	371+	(6) .50 MG	F6F series was first U.S. military aircraft designed entirely after Pearl Harbor to get into action. Major changes from F4F series were use of larger R-2800 engine, relocation of landing gear in wings instead of fuselage. Rearward-folding wing feature was retained. F6F-3 was first production model, and went into action from Pacific carriers on September 1, 1943 during a raid on Marcus Island. F6F-5's still in service with Naval Reserve units.
	8,982	12,039	417 (or 19,900)	(6) .50 MG or (2) 20 MM	Gull-winged F4U first flew in 1939, and was first Navy plane to use the new P&W R-2800 engine. First production model flew in June, 1942. Initial use by Navy and Marine Corps was as a land-based fighter, carrier operation not getting under way until late 1943. Production of "Corsairs" continued right up to Korean war, and last models built were designated as AU-1 assault types instead of retaining the original fighter designation.
	3,477 (Land) 3,687 (Sea)	5,226 (Land) 5,702 (Sea)	168 (Land) 162 (Sea)	(2) .30 MG	The SOC series was probably the most obsolete aircraft that U.S. forces put into action, production having started in 1935, but the type did so well at its specialized job that it outlived a more modern type designed to replace it. "Seagull" was convertible wheels to floats, but was mainly used as a seaplane, catapulted from Battleship and Cruiser decks. Wings folded to facilitate shipboard stowage.
	20,910	34,000	179 (or 7,000)	(4) .50 MG (1) .30 MG	All PBV models through -5 and British Catalinas through II were straight flying boats. PBV-5A and Catalina III were amphibians. Naval Aircraft Factory built a number of boats as PBN-1 with redesigned tail. This model duplicated by Boeing-Canada as PB2B-1. Consolidated adopted high tail on PBV-6A model. PBV-5A's built by Canadian Vickers were delivered to U.S. Army as OA-10's. Some PBV-5A's and 6A's still in service with Naval Reserve Units.
	31,013	56,094	205 (or 13,000)	(8) .50 MG	Basic configuration of Martin "Mariner" was first tested by constructing and flying a quarter-size scale model. First production models featured retractable wing tip floats. PBM-3 and subsequent had fixed floats. Engine changed from Wright R-2600 to P&W R-2800 on PBM-5. XPBM-5A was amphibian with landing gear configuration similar to Consolidated PBV-5A. Same gull-wing was used on Postwar P5M series utilizing new concept of flying boat hull design.
	6,435	10,400	255 (or 16,000)	(2) .50 MG (2) .30 MG	SBD series was direct development of Northrop BT-1 dive bombers of 1936, which were a Navy equivalent of Army A-17. Configuration of SBD's resulted from considerable modification of XBT-2. Army A-24's were SBD-3's diverted from Navy in 1941. Later A-24B's were built for Army in Douglas Tulsa plant. SBD's were mainstay of Navy and Marine dive-bomber operations in Pacific. Few remaining Army A-24's were redesignated as F-24 when A designation was abandoned after the war.
	10,960	16,940	278	(3) .50 MG (1) .30 MG	Prototype XTBF-1 was delivered to Navy in 1941, and production models were in action at Battle of Midway in June, 1942. TBM-1's were originally built by General Motors from Grumman-supplied parts. Grumman later ceased production on the type, and all subsequent "Avengers" were built by GM.
	4,670	7,112	176	—	The Grumman JF-J2F "Duck" series can trace its development straight back to the Loening amphibian that was developed in 1923 when Grumman worked for Loening. The JF appeared in 1934 and served as a workhorse utility type on carriers and ashore to end of WW-II. After Grumman ceased production, Columbia Aircraft turned out latest models as J2F-6 under license. Columbia produced a monoplane version, the XJL-1, on its own.



North American P-51A



North American AT-6C





Grumman F6F-5 not on chart





Curtiss SOC-3



Consolidated PBX-5A



Martin PBM-3





Grumman TBF-1



ODD AMERICAN AIRCRAFT OF WW-II

The airplanes in this section have been designated as "Odd" types, not that they are freaks by normal standards but because certain structural modifications or changes of function distinguish them from their standard counterparts previously illustrated in Section One of this booklet. In some cases aircraft which are completely conventional today (1961) are included because they were new and unconventional, therefore "Odd," during World War II.

Because of the terrific increase in the complexity of aircraft structures between World Wars, resulting not only in years of lead time between the start of a new design and the first flight of the prototype but still more years to the delivery of the first production article, much attention was devoted to adapting existing production models to other purposes rather than taking the time to develop an entirely new model for the specific task. Among the early examples of this practice was the use of standard fighters as fast photo-reconnaissance planes. Fighters had been used for such purposes during World War I, but the WW-II applications resulted in sufficient change to the aircraft and their equipment to justify permanent changes of designation. In some cases, notably the Lockheed F-38/F-4/F-5, all guns were deleted and replaced by cameras although the F-4A model retained two, while the P-51/F-6, with cameras in the aft fuselage, retained its standard fighter armament in the wings. The heavy bomber photo conversions invariably retained their defensive armament and sometimes part of their bombing capability.

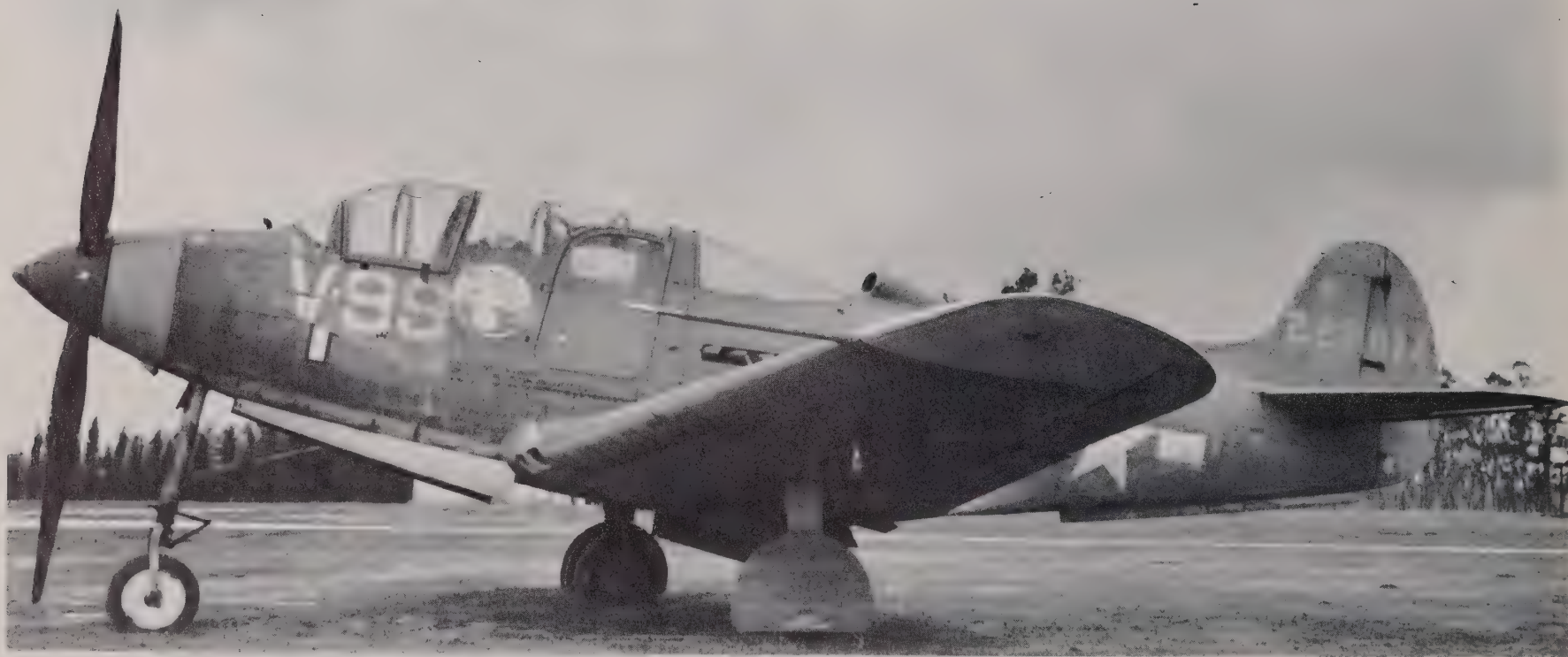
Aircraft of many types were pressed into service at various times as transports, but in only one notable case was a standard military airframe modified and placed in production as a passenger/cargo plane. The roomy fuselage of the Consolidated B-24 suited it to conversion as the C-109 tanker, the F-7 photoplane with cameras in the bomb bay, and the AT-22 trainer with additional flight engineer stations installed. The Navy also modified standard patrol-bomber models to transport configuration but retained the original type and model designations, adding the suffix "R" to the original designation to indicate the transport status.

In the plane-short years of 1941-42, many small aircraft were purchased from private owners for use as utility personnel transports or for evaluation as pos-

sible Liaison types. Since these were procured directly from their owners and not from the factory, the first inkling that some manufacturers had of their products being in uniform came when aviation writers, having seen the new designations on lists published by the military, thought in terms of normal procurement and wrote to the manufacturers for details and pictures. Since these were well-proven type-certificated designs, there was no need to run them through the usual military flight testing procedures. They were given a coat of warpaint and put right to work, and as a result were seldom photographed in their military markings "for the Record" as is done with all models tested at Wright Field or other centers. Because of their rarity, photos of several of these drafted civilian models are included here.

Several entirely new military aircraft types evolved during WW-II, notably the jet and the helicopter. While the helicopter as a type was almost as old as the airplane, it was not developed to the point of operational practicability until after 1940. The principles of jet propulsion were likewise well known, and had been tried on aircraft as early as 1911. The glider was also an "Old" aircraft type but made its initial military appearance during the war years. While even the idea of the troop-carrying glider was not new, the application of it was considerably different from the Sunday-Supplement and Sensational-Magazine concept of hundreds of troops being slipped silently behind enemy lines at night to take a strong point by surprise. As finally standardized, the military glider was a very low performance machine quite incapable of covering great distances on its own in sailplane fashion. It was highly vulnerable to enemy defenses, aircraft and flak while on tow and ground fire during descent, and could be used on a large scale only under circumstances of absolute local air superiority. Even then, it was released directly over the target or very close to it. Since WW-II, the troop glider has been dropped by all Air Forces and replaced by the more flexible and less vulnerable short-range assault transport. In the United States these designs are the direct result of adding powerplants to standard cargo gliders.

All together, the airplanes in this section, both one-shot experimentals and mass-produced models, complement the more conventional types presented in Section One and add significant detail to the overall picture of American Airpower from 1941 through 1945.



TP-39 . . . As far back as WW-I, instructors had recognized the problem involved in switching a student from an advanced trainer to a fighter plane, and several attempts had been made to convert some fighters into two-seater trainers with which to bridge the gap. In WW-II, the trick was tried again. Most radical conversion was that made to the P-39, resulting in the TP-39 shown here. The un-

usual configuration of the airplane itself did not lend itself readily to the addition of a second seat. Other two-seater fighter developments were TP-40 and TP-47. P-38 pilots had often carried passengers or instructors "pig-a-back," but no trainer designation was assigned. A two-seater night fighter, the P-38M, was developed, the radar operator sitting behind the pilot.



P-322 . . . Some of the aircraft taken over by the U.S. Army from British contracts were so different from their standard U.S. service counterparts that they could not be given the same basic designation. Such was the case of the "Lightnings" ordered by Britain—both engines were right-hand drive, they did not have turbo superchargers, and the systems and equipment were different. The Army

applied the factory model number to these, 322, and prefixed it with the letter "P" for pursuit. Types taken over in this way were not given U.S. serial numbers, but used the original British numbers. Airacobras from British contracts were called P-400 instead of P-39, and Venturas were called Model 37 instead of the corresponding U.S. designation of B-34.



P-75A . . . The P-75 was supposed to be a ready-made answer to the problems of developing a new fighter design and getting it into production. The first prototype used components of many existing airplanes: P-40 wing, SBD tail, F4U landing gear. Powerplant was the "Double" Allison V-3420 driving a six-bladed counter-rotating propeller. The engine was behind the pilot as in the P-39.

The P-75 was entirely redesigned before it got into production, and the plan to use existing components was dropped. 2406 P-75A's were ordered, but the order was canceled, and only six, other than the two prototypes, were built. The P-75 was designed by the Fisher Body of General Motors Corporation, and was to have been built at the Cleveland Municipal Airport.



XC-108A . . . The Basic B-17 model was a very versatile aircraft, and was used for many purposes other than the primary mission of bombing. One extreme modification was the XC-108, a cargo conversion, in which a large cargo hatch was cut in the side of the fuselage of a standard B-17F. Only four C-108's were produced; the XC-108 and YC-108 were personnel transports and the XC-108B

was a fuel tanker. A considerable number of B-24's were modified either at the factory or in the field as C-109's for the purpose of ferrying fuel over the treacherous "Hump" route from India into China. The C-109's were not popular with flight crews because of the constant presence of fuel fumes and hazard of fire and explosion in mid-air.



XP-77 ... The Bell XP-77 was an entirely new concept in American fighter plane design. It was an attempt to produce a cheap and lightweight interceptor of non-strategic materials. Construction was all wood, and the power of the 575 hp inverted Ranger engine was extremely low by contemporary fighter standards. Maximum speed, however, was in excess of 400 mph, a good speed

power ratio. Armament consisted of one 20-mm cannon firing through the propeller hub, with two .50 caliber machine guns synchronized to fire through the propeller. Six experimental prototypes were originally ordered, but only two were completed. The "Baby Interceptor" idea is being tried again with such designs as the French "Baradour" and the British Folland "Gnat."



P-63A "PINBALL" . . . The Bell P-63A "Pinball" was a target plane with a difference—it was fired upon with live ammunition, but it was not radio controlled! A human pilot flew it, but he was protected by extra-heavy dural covering on the airframe and by the fact that the plastic bullets fired at him by the gunners in the bomber trainers were "frangible," that is, shattered on impact. Pressure

pickups were installed throughout the aircraft structure to detect hits. When the target was hit, the pressure pickups illuminated a light in the propeller spinner, hence the name "Pinball." Later models of the target P-63's also had lights on the sides of the fuselage. P-63's were not used in combat by U.S. forces, but were used in quantity by the Russians as tank-busters.



PQ-14 . . . One of the World's oddest special-purpose airplanes was the radio-controlled target drone, of which Culver PQ-14B low winger is typical. Originally, obsolete standard service types were fitted with radio equipment and used as targets under the designation of "A." This duplicated the attack plane designation, so the designation was changed to "PQ" when the target version of the well-known commercial Culver Cadet was purchased in 1941

as PQ-8. The PQ's used human pilots for ferrying and test purposes. Smaller targets, averaging 12 feet in span, were built under the "OQ" designation. Over 800 PQ-14's were built. Colored bright red, they had a span of 30 feet, a gross weight of 1820 pounds, and a maximum speed of 180 mph. 1200 duplicate targets were built for Navy under designation of TD2C-1.



P-38L "DROOP SNOOT" . . . The "Droop Snoot" P-38 was a slick wartime trick that worked fine until the element of surprise wore off. German fighters and flak would concentrate heavily on bombers approaching target cities, and not pay much attention to the fighters. Some of the P-38's, therefore, were fitted with transparent bomber-type noses, and a bombardier was stationed in the nose. A formation

of fighters, with bombs instead of drop tanks under their wings, would fly over a city following a "Droop Snoot," and would drop their bombs on signal from the lead ship with effective results. On other occasions, the de-gunned nose was used to carry passengers. In some cases, cargo and even passengers were carried in converted drop tanks between the nacelle and the fuselages of the P-38.



C-87 . . . The C-87 was a straight military transport version of the B-24 bomber. All armament was removed, and a large passenger cabin ran right through the bomb bay and aft fuselage. Streamlining of the design was greatly improved over that of the bomber by fairing over of the nose and tail turrets. The Navy and the British Royal Air Force used these converted types as well as the Army.

Army C-87 was duplicated by RAF Liberator VII and Navy RY-2. C-87A was matched by Navy RY-1, and C-87C was a single-tail model called Liberator IX by the RAF and RY-3 by Navy. A B-24 wing and C-87C tail were fitted to an entirely new fuselage in an attempt to produce a postwar commercial transport, but the design was not economical and was scrapped after airline testing.



F-6D . . . The F-6 series of photo-reconnaissance planes were conversions from the P-51's, and retained the original fighter armament. The cameras were mounted in the fuselage aft of the cockpit. At first, series letters were assigned to the F-6 series in order of new changes, F-6A, F-6B, etc., but this was soon changed to correspond to the series letter of the original fighter. F-6D's were photo ver-

sions of P-51D, F-6K's were conversions of P-51K, etc. This logical system was not used on any of the other photo-conversions. Another development of the basic P-51 was the A-36, the only single-seat dive-bomber used by U.S. forces. The only visible difference between the bomber and the fighter was the installation of hinged dive brakes on the upper and lower surfaces of the bomber wing.



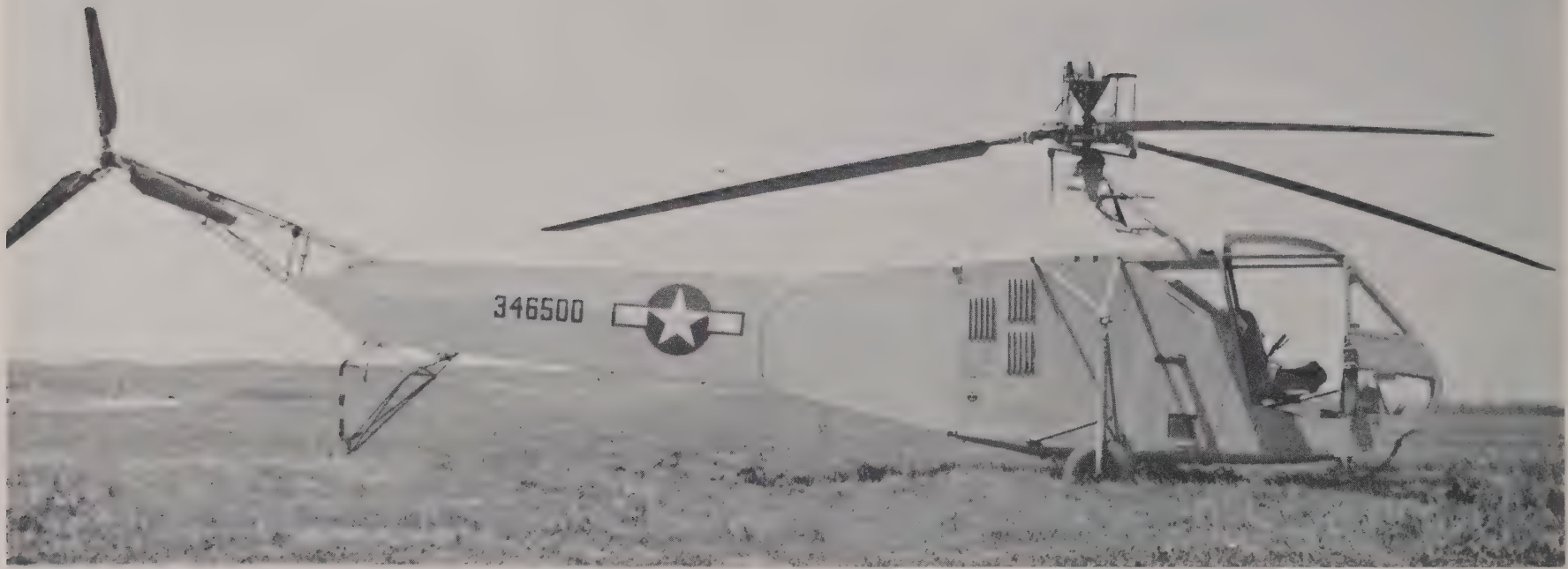
RB-1 . . . The Budd RB-1 was one of the several ramp-loading cargo designs that were developed in an attempt to speed up the loading and unloading of cargo in the field through low floor levels and easy access. The most unique feature of the design, other than the tail-loading ramp, was the uses of stainless steel for construction. 200 "Conestogas" were ordered by the Navy under the designation

of RB-1 and 600 were ordered by Army as C-93's. The prototype flew in October, 1943, but production difficulties delayed schedules and raised costs to the point where the Army contract was canceled and the Navy contract was reduced to 25 ships. Several were bought by non-scheduled air-freight lines after the war, soon replaced by DC3's.



F-5G . . . For short-range photo missions into enemy territory where speed and the element of surprise were the best defense, fighters were equipped with cameras in place of their fixed forward-firing guns. The first such photo-conversion was the Lockheed F-4, formerly the P-38E. The F-5 was a similar development of the P-38G, and from a short distance could hardly be distinguished from the

fighter. The F-5G, illustrated here, was converted from P-38L, and featured a completely redesigned nose to house more and larger cameras. Approximately 1500 F-4's and F-5's were produced. Some conversions were made in the field while others were factory-built, alternating with standard fighters on the production line.



R-4B... The first successful American helicopter was developed by Igor Sikorsky in 1940, and by 1942, the first military version was flying as the XR-4. This was followed by 30 YR-4's and 100 R-4B's. A few of the whirlybirds, called "Hoverfly" by the British Royal Air Force, were sent overseas during WW-II, but they were not an important factor in operations. Performance of the R-4 series was limited, and the type, along with equivalent

Navy HNS-1, was used largely for training. The next model, R-5, was marketed commercially as model S-51, and was built under license in other countries. The helicopter came into its own as a piece of military equipment in the Korean war, where it was used for observation, communications, and for evacuation of wounded from forward areas.



C-70B . . . Twenty-one Howard C-70's were purchased, covering five models ranging from DGA-8 through DGA-15P. The C-70B, originally a DGA-15J, powered with a Jacobs engine, is shown here. The Navy drafted a few civilian planes, but not nearly as many as the Army. Approximately 500 Howard DGA-15's were built for the Navy, some as instrument trainers under the designation

of NH-1 and the remainder as light transports under the designation of GH-1 and -2. The Howards can trace their development straight back to Benny Howard's famous "Mister Mulligan" racer of 1935, winner of both the Bendix and Thompson Trophies. "Nightingale" was title bestowed upon Navy Howards under early WW-II system of giving airplanes popular names.



F-7B . . . The F-7 was a photo-reconnaissance conversion of the B-24 bomber, and is typical of similar bomber conversions. It was extremely important that photographs be obtained of distant targets before large-scale bombing attacks were begun, and bombers were the only existing types that had the necessary range and defensive firepower. Consequently, the bomb racks were removed and numer-

ous camera installations were made in bomb bay and fuselage. Photo conversions of other bombers were F-8 from de Havilland Mosquito, F-9 from B-17, F-10 from B-25, and F-13 from B-29. As a ruse, the "Enola Gay," the B-29 that dropped the first A-Bomb, was given reconnaissance markings in the hope that stray Jap fighters would think it a photo ship.



TG-5 . . . When the Army glider training program started in 1941, high-performance sailplanes were used as trainers. Since there was no comparison between the performance of these and that of the low-performance cargo gliders which the pilots were to use in combat, the sailplanes were declared surplus, and a new type of training glider was developed from conventional lightplanes. The Aeronca

TG-5 shown here is typical of Taylorcraft TG-6 and Piper TG-8, in which the 65 hp engine was removed and replaced by a third crew member station. Altogether, 759 of these three-placers were built, nearly double the number of sailplanes that had been procured. However, none were put into civilian use after the war except as reconversions to 65 hp lightplanes.



B-24J Modified Nose . . . This B-24J is typical of many ships modified in the field for special purposes without changing the basic designation of the airplane. In this case, the nose turret has been removed and the nose has been extended somewhat, apparently for observation purposes. Changes of this type were made for specific operational reasons, and did not always find their way into production.

Sometimes changes were made in the United States in an attempt to improve the combat effectiveness of the airplane, and a single ship was sent to join an operational group to try the new configuration. At other times, a modification tried in the field proved to be effective, and the ship was flown back to the States so that the new feature could be copied.



C-72 . . . In addition to drafting airliners, the Army bought a great number of personal-type aircraft from private owners, and ran into headaches with the variety of models that were grouped under one designation. Of 43 Waco biplanes purchased, no more than 12 were of the same model. Altogether, 15 different models were represented under the one designation, with series letters ranging up

to C-72P. Many commercial models that were purchased were out-of-production models that were almost impossible to maintain in military service because of the unavailability of spare parts. In many cases, one of a kind was purchased, as in case of Lockheed Orion C-85 and Lockheed Vega C-101.



YB-40 . . . The YB-40's were standard B-17 bombers converted into long-range escort fighters. All bombing equipment was removed, and extra armor and guns were installed. The theory was that these B-40's could accompany bombers to targets that were beyond the range of standard fighter escorts. The B-40's could keep up with the bombers on the trip out, but were at a disadvantage on the way

back in that the bombers had dropped their loads and were considerably lighter, while the B-40's were still loaded down with unjettisonable armor, guns, and ammunition that caused them to lag behind the formation. The course of the war soon put standard fighters within range of most targets, and the conversion of large bombers to escort fighters was abandoned.



C-73 . . . Boeing 247 commercial transport, one of 27 drafted into Army service in 1942. U.S. Airlines suffered heavily from such drafts of their equipment in the first year of American participation in WW-II. Some planes were taken directly from scheduled routes while others were nabbed as they rolled out of the factory door. Such drafted equipment was eventually replaced, however, either by the re-

turn of the same machines or their replacement with similar types. Some airlines that used Douglas DC-3's with left-hand doors got back a number of DC-3's with right hand doors, or Cyclone instead of Wasp engines. Most of the prewar airliners were declared surplus and were out of military service before the end of World War II.



Ryan FR-1 . . . Although it was designed during the war, the Ryan FR-1 "Fireball" cannot be rightly called a WW-II plane since it did not get into service until after the war. Outwardly, it was a conventional-looking single-engined fighter with tricycle landing gear. However, it was actually a two-engine ship, in that a General Electric I-16 turbojet in the central part of the fuselage supplemented

the Wright R-1820 radial piston in the nose. A "Fireball" made what is believed to be the first jet landing on a carrier when it approached the "Wake Island" using only the jet powerplant on November 6, 1945. Maximum speed using both powerplants was 425 mph and rate of climb was 4800 feet per minute.



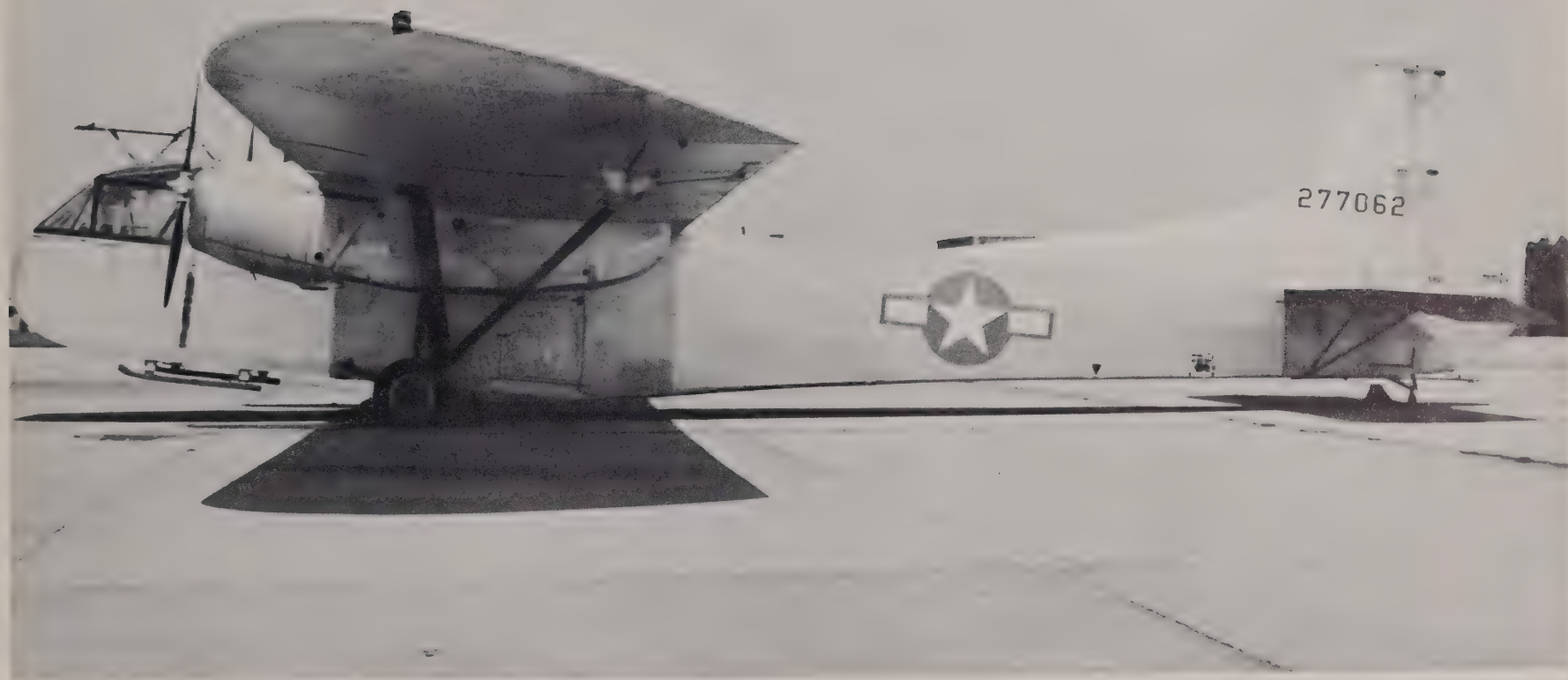
B-17H . . . One of the unique purposes for which the B-17 was used, when enough ships were on hand to permit diversion to purposes other than bombing, was that of carrying an airborne lifeboat. This had been developed by the British, and was soon adopted by U.S. services. B-17G's were modified, and were redesignated as B-17H. On some, the nose chin turret was replaced by a search radar, but

others retained their defensive armament. Many other B-17's were converted to personnel transports, but their basic designations were not changed other than to add a "V" or "C" prefix to their bomber designation. This practice was also followed with other bombers, especially B-25's used for fast transportation of VIP's as CB-25's.



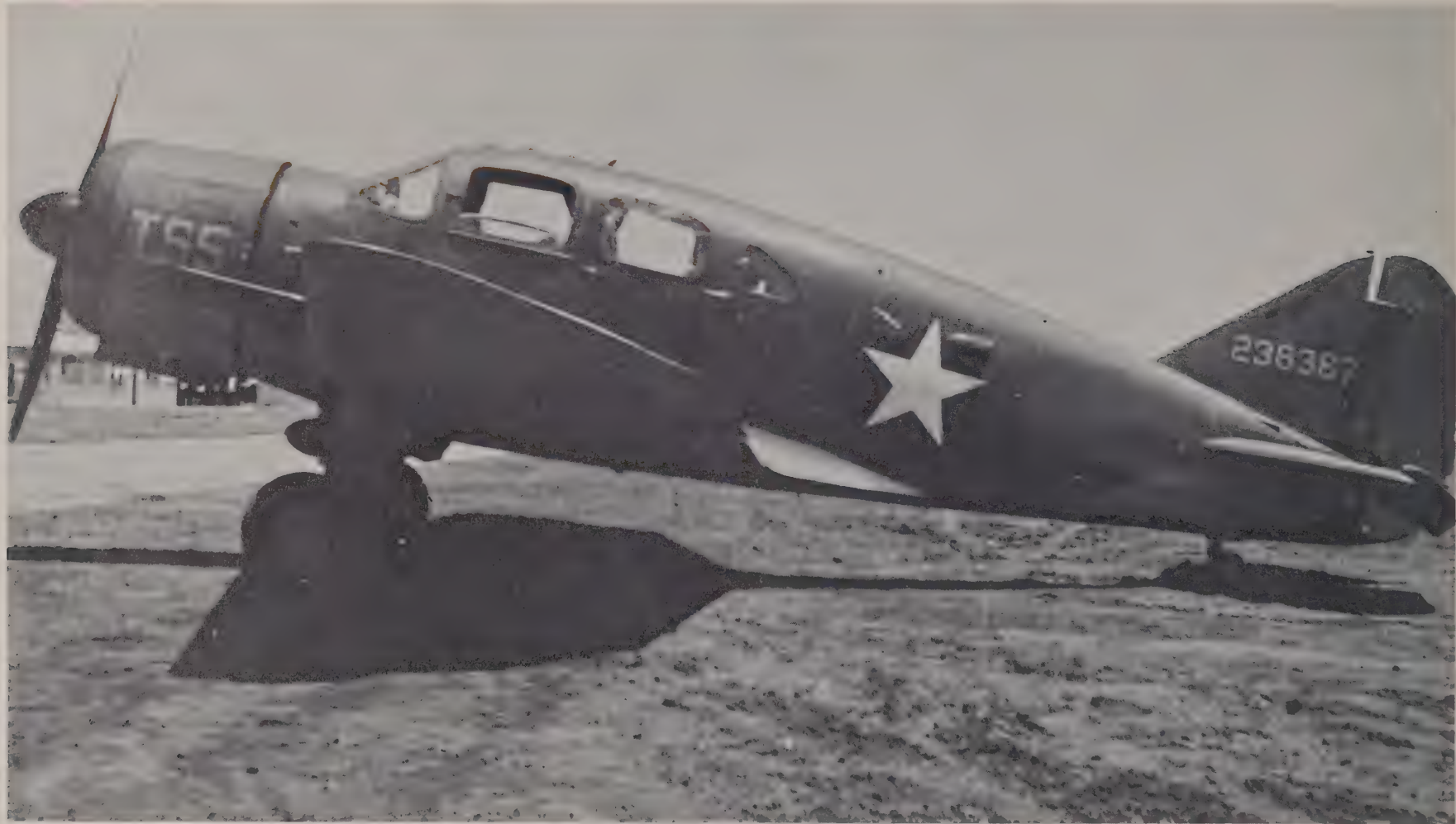
XCG-17 ... The XCG-17 was a unique experiment in glider development. A standard Douglas C-47 cargo plane was converted by removal of the engines and most of the standard airplane equipment. The resulting glider had a gross weight of 26,000 pounds, nearly that of the basic C-47, and a useful load of 15,000 pounds. It had a glide angle far in excess of the CG-4A glider but none of the

low speed and short-field-landing characteristics. It was towed by a single B-17 or by two C-47's in tandem, a switch on the practice of one towplane pulling several gliders. The XCG-17 could have been an even better glider than it was except for the fact that specifications required that the airframe be unaltered so it could be converted back to a C-47 powerplane.



PG-2 . . . The PG-2 was one of several attempts to increase the utility of the standard Waco CG-4A cargo glider. The first was the XPG-1, which Northwestern Aeronautical Corporation converted to a powerplane by adding two 120 hp Franklin air-cooled engines. The theory was that the ship could be towed to the target as a glider, then the engines could be brought up and attached, and the ship

could fly home under its own power. The ship was too low powered, and Ridgefield built the XPG-2, shown here, with 200 hp Rangers. Ford and Ridgefield each built one XPG-2A, and Northwestern built 10 production PB-2A's. These were still underpowered, and Waco took a hand by adding two 225 hp Jacobs to the smaller CG-15 glider and using JATO bottles as well, calling it the XPG-3.



C-71 ... The Spartan C-71 was the standard prewar "Executive" model, a 5-place design typical of many purchased by the Army from private owners. Altogether, 16 C-71's were obtained in this way. Practically all of them were sold back into civilian service at the end of the war. Military purchase of civil types and assignment of type numbers in sequence produced some odd combinations.

In 1929, Army bought several Fairchild 71's and called them C-8. In 1942, Army bought three Fairchild FC-2W2's, which were one year older, and called them C-96's. One Lockheed Vega was bought in 1931 and called C-12 and another was bought in 1942 and called C-101. Cessna DC-6B of 1929 and C-37 of 1937, entirely different airplanes, were called C-77A and C-77C, respectively.



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